Technical Disclosure Commons

Defensive Publications Series

January 2020

TOOL-FREE 3D PRINTED THREADED UNION METHOD WITH REMOVABLE TIGHTENING ACCESSORY

HP INC

Tool-free 3D printed threaded union method with removable tightening accessory.

The process of connecting parts to form a single body is needed when the components have different materials or when it has been impossible to manufacture the final part in a sole and continuous body. This process is common in the 3D printing world as the size of the parts that can be printed is limited to the machine capabilities, and nowadays these are very limited compared to the traditional manufacturing methods. In powder-based 3D printing technologies, splitting parts into several components might also be a convenient strategy to improve the unfused powder removal process or to improve the nesting and positioning of the parts inside the build chamber. The union method described in this article provides a strong joint, that doesn't require any postprocessing after the printing process, that doesn't require any tooling and that the tightening accessory can be removed to obtain a neat union. This method intends to reduce the assembly time, helps the operator doing the job and takes advantages of the design freedom in 3D printing. This idea can also greatly improve the process of other union techniques such as adhesive bonding, where good positioning of the parts is needed and pressure must be applied until the adhesive has cured.

The method presented in this article consists of 3 different parts (Figure 1): A and B are the parts (or group of parts) that need to be joined and the Threaded Accessory is used to perform the link between A and B. First step in the process is to design the standard 3D geometry of the union, which will then be applied by using boolean and combination features in a 3D modeling application to any group of parts that are to be joined. Once the final designs have been printed, the treaded accessory must be pulled out (Figure 2a), parts A and B are positioned and joined by screwing the Threaded Accessory (Figure 2b). Lastly, the threaded accessory is broken to remove the subjection feature that helped to tighten the union (Figure 2c).

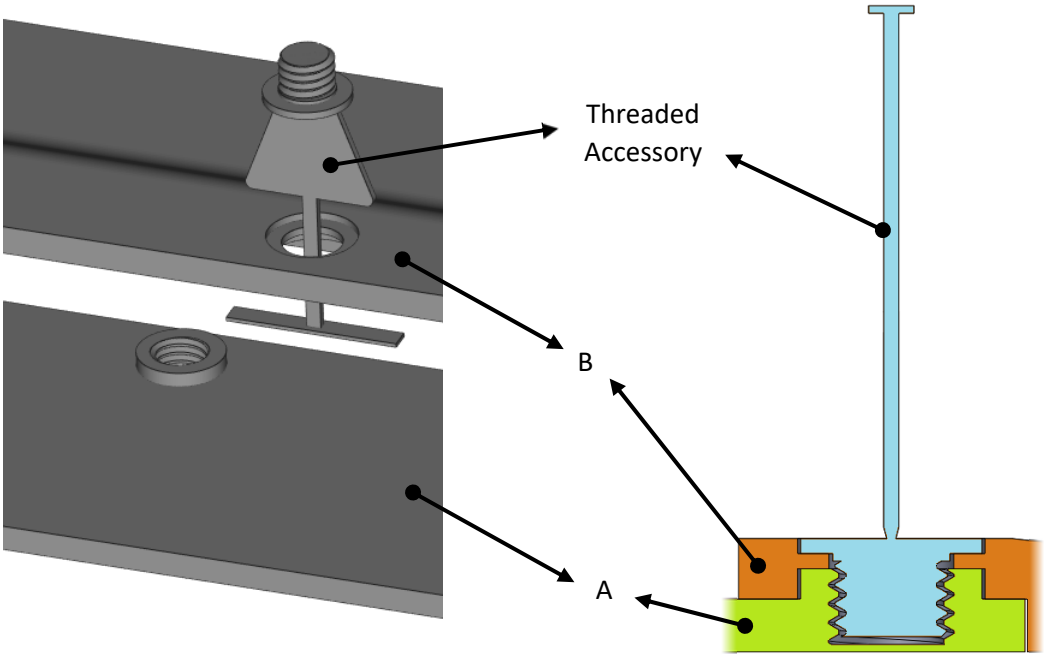

Figure 1. Left: design to be printed. Right: Cross section of the union once assembled.

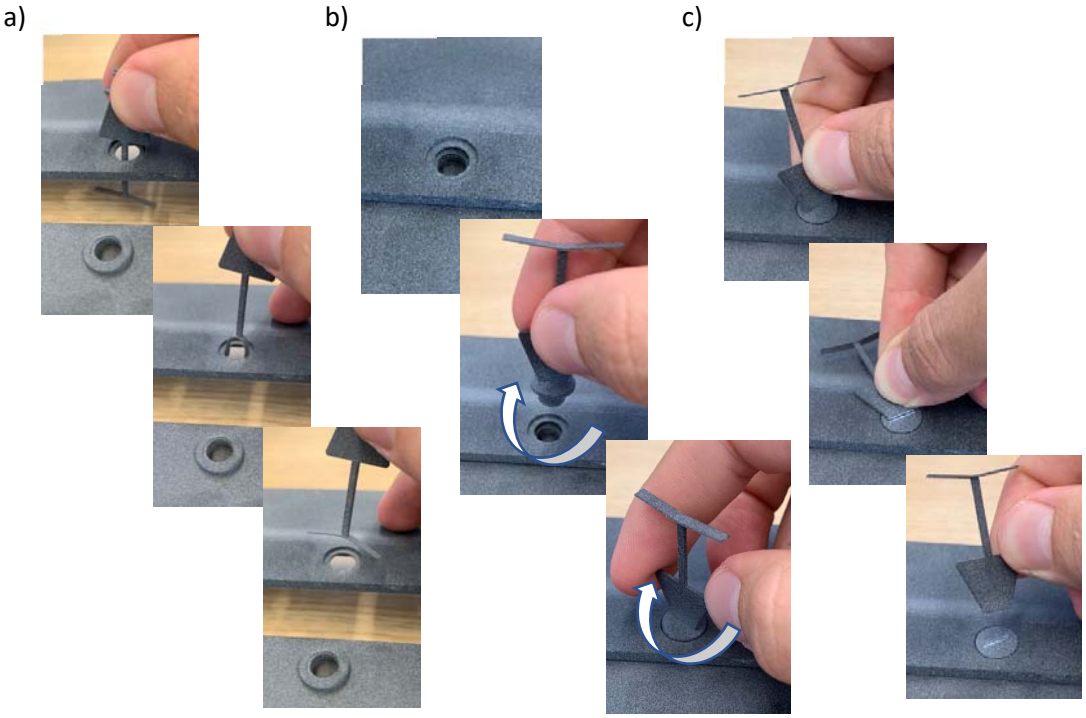

Figure 2. Assembly process.

Disclosed by Lucas Rotllant, HP Inc.